

Preface

More than five hundred years have elapsed since Johann Gutenberg perfected his revolutionary idea of movable type. His invention marked the beginnings of book production and eventually led to the mass distribution of ideas and information. Gutenberg's printing press introduced two very important concepts to the Western World. First, impressions were made by pressing inked characters against a sheet of paper. Second, because a separate piece of type was used for each character, the character molds were reusable on subsequent pages. But during the following centuries printing technology advanced at a snail's pace compared to today. And even now, many printing presses still create characters on a page by the direct or indirect impact of an inked, reusable character mold on paper.

In the mid-twentieth century, the arrival of computers created the need to print large quantities of data at a very high rate of speed. It was only natural that the first computer printers would adopt the impact printing technology of the day. These first computer printers created a line of print by the impact of a row of movable characters against an inked ribbon. Fueled by this demand for the high-speed output of data, printer development began to accelerate.

One major development occurred in the early 1950s, when some printers were simplified by the process of building characters from an array of dots. Print heads no longer had to carry molds for each character. Instead, each character was formed by printing a different set of dots out of the array.

Although the array concept presented a simple way to form characters, the real significance was that it brought added function to printers. Once the basic printing element became a dot, users gained the ability to build not only characters on paper, but pictures, charts, and graphs as well.

Over the last thirty years, the need and demand for these advanced functions, as well as color and higher-quality resolution, have been growing. Today, some limitations of impact printing appear to prevent it from meeting these needs for advanced function in every segment of the marketplace. Input and central processing units have made the transition from electromechanical devices into the quiet, high-speed world of electronics. But only now are printers on the verge of that transition.

Non-impact printing technologies such as ink-jet, thermal-transfer and electrophotography are fast becoming capable of meeting application requirements from word processors to personal computers to the largest data processing systems. But while non-impact printing has always offered the advantages of quiet operation, high-quality resolution, and high-function operations, its hardware costs and reliability cannot yet match those of impact printers.

Over the next several years, continued advancement of non-impact printing technologies poses broad challenges to our development laboratories. Even so, one tends to be optimistic about its prospects, as supported by the papers in this issue of the *IBM Journal of Research and Development*. Impact printers will continue to hold a significant position in the years to come; however, non-impact printing will not only become more reliable than it is today, but it will also attract more applications as its price/performance improves.

Edward E. Lucente

Edward E. Lucente is an IBM Vice President and President of the Information Products Division. IPD develops and manufactures a wide range of impact and non-impact printers.